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Conversion of Rod to Smoke^(1,2,3,4)

Work has continued on the interpretation of the experimental data obtained on the output of Marlboro Monitor #15 cigarettes over a wide range of parameters. In particular smooth functions have been to the TPM-flow rate data for the unfiltered rod and for the rod with several common types of filters. These functions are as follows:

<u>Cigarette</u>	<u>TPM/35cc Puff (F is Flow Rate)</u>
Marlboro M15 without filter	$1.242 + 5.191 e^{-.000197F}$
Marlboro M15 with Marlboro CA filter	$2.683F^{.03307} e^{-.0001163F}$
Marlboro M15 with Ecusta Paper Filter	$1.098 F^{.1417} e^{-.0001836F}$
Marlboro M15 with Dilution CA filter	$.5911 F^{.2188} e^{-.0001457F}$
Marlboro M15 with Filtrona filter	$.4828 F^{.2846} e^{-.0001634F}$

The puff volume-TPM relationship is that the TPM/puff is proportional to $(Vol)^{1.24}$ for all flow rates. Similar types of functions are being developed for tar, nicotine, and water so that they can be used for design purposes.

Work has continued on the deposition and calibration of differential thin-film thermocouples to be used in the high speed thin foil scanning calorimeter being constructed.

Catalyst Mechanism⁽⁴⁾

The computer program to calculate the energy levels of Cu^{2+} ions in arbitrary symmetry sites has been updated. Calculations of the crystal field levels indicates that for the octahedral and tetrahedral sites equal values of the crystal field parameters results in the levels coinciding with the observed optical bands. The pure octahedral and tetrahedral configurations give rise to fewer levels than actually observed. Distortions of geometry will be necessary to account for the observed number of transitions in the optical spectra.

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References:

- (1) A. C. Lilly, Book 6292, pp. 20-35.
- (2) S. L. Thurston, Book 6233, pp. 41-100.
- (3) C. O. Tiller, Book 6424, p. 2-10.
- (4) A. J. Kassman, Book 6274, pp. 58-67.

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